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EXAMINER LEE, SHUN K				
ART UNIT 2884		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

09/06,457

Applicant(s)

CASPERSEN, CHRISTIAN

Examiner

Shun Lee

Art Unit

2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2008 and 31 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,7,9,11,12,15,16,23,24,27,29,36,37,44 and 47-51 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,7,9,11,12,15,16,23,24,27,29,36,37,44 and 47-51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Final Drawing (PTO-940)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 7, 9, 11, 12, 23, 24, 27, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malin *et al.* (US 5,377,002) in view of Hamashima *et al.* (US 4,744,663).

The claim limitation "scanning means for scanning the specimen in relation to the detector" is being treated under 35 U.S.C. 112, sixth paragraph and has been construed to cover the corresponding structure described in the specification (e.g., "The scanning means may comprise a DC motor and a spindle rigidly connected to the DC motor" in lines 32-33 on pg. 4 and "The scanning means may also comprise deflecting means that may comprise a servo motor or a stepper motor connected to the member holding the specimen and thereby adapted to scan the first light beam along a radius of the circular movement of the disc holding the specimen" in lines 2-5 on pg. 5) and equivalents thereof (MPEP § 2181).

The claim limitation "means for rotating the member" is being treated under 35 U.S.C. 112, sixth paragraph and has been construed to cover the corresponding structure described in the specification (e.g., "The scanning means may comprise a DC motor and a spindle rigidly connected to the DC motor" in lines 32-33 on pg. 4) and equivalents thereof (MPEP § 2181).

The claim limitation "means for displacing the member along a radius of the rotation of the member" is being treated under 35 U.S.C. 112, sixth paragraph and has been construed to cover the corresponding structure described in the specification (*e.g.*, "The scanning means may also comprise deflecting means that may comprise a servo motor or a stepper motor connected to the member holding the specimen and thereby adapted to scan the first light beam along a radius of the circular movement of the disc holding the specimen" in lines 2-5 on pg. 5) and equivalents thereof (MPEP § 2181).

The claim limitation "scanning control means for controlling the scanning means for scanning the specimen" is being treated under 35 U.S.C. 112, sixth paragraph and has been construed to cover the corresponding structure described in the specification (*e.g.*, "The scanning control means may comprise servo means adapted control the rpm of the disc, to produce a substantially constant linear velocity of the laser spot on the disc surface, a principle well known from CD players" in lines 27-29 on pg. 16) and equivalents thereof (MPEP § 2181).

The claim limitation "storage means for storing detector signals relating to the marked objects provided by the detector and corresponding position signals provided by the scanning control means" is being treated under 35 U.S.C. 112, sixth paragraph and has been construed to cover the corresponding structure described in the specification (*e.g.*, "The storage means may comprise magnetic, optic or electric storage media, such as hard disc drives, DAT-tapes, floppy discs, CD-ROM discs, EEPROMs, etc. which may be utilised for non-volatile storage of the coherent data sets obtained from the scanning of the specimen(s). The storage means may also comprise intermediate volatile storage means, preferably RAM, to store coherent data sets during the scanning" in lines 9-14 on pg. 14) and equivalents thereof (MPEP § 2181).

The claim limitation "means for retrieving the position signals stored in the storage means" is being treated under 35 U.S.C. 112, sixth paragraph and has been construed to cover the corresponding structure described in the specification (e.g., "The storage means may be located in a personal computer (PC), which is operationally connected with the apparatus of the present invention" in lines 8-9 on pg. 14) and equivalents thereof (MPEP § 2181).

It should be noted that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" (*Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)) if the prior art apparatus teaches all the structural limitations of the claim (MPEP § 2114). Thus, "wherein the marked objects are marked with a fluorescent stain" was not given any patentable weight since the object marked by a fluorescent stain is not a component of the claimed apparatus and does not appear to impose any additional structural limitations on the claimed apparatus.

In regard to claim 1, Malin *et al.* disclose (Fig. 1) an apparatus for identifying a position of objects having unknown positions and detecting a property of the objects contained in a specimen (11), the apparatus comprising:

- (a) a frame (28.1);
- (b) a member (13) positioned on the frame (28.1) and having a surface that is adapted to receive and hold the specimen (11);
- (c) at least a first light source (2) for emitting at least a first light beam (1) towards the specimen (11) held by the member (13), wherein the first light beam (1) is adapted to provide a light spot (12) having a diameter on the specimen (11);

- (d) at least one beam-splitter (18 or 62 in Figs. 1 and 4a) being arranged to reflect the first light beam (1) towards the specimen (11);
- (e) at least a detector (19) for detecting light (14, 15) emitted from the objects upon interaction with the first light beam (1), the first light source (2) and the detector (19) being arranged so that a part of a light beam path from the first light source (2) to the specimen (11) is co-axial (along optical axis 34) with a part of the light (14, 15) emitted from the objects;
- (f) scanning means (27.1, 27, 27.2, 28.2, 28) for scanning the entire surface of the member (13) in relation to the detector (19) along a non-linear curve (e.g., " ... the whole of the surface is scanned along a spiral path ... "; column 10, lines 26-29), wherein the scanning means (27.1, 27, 27.2, 28.2, 28) comprises means (shaft 27.1 of a rotary motor 27) for rotating the member (13) and means (linear stage 27.2 on a spindle 28.2 of translation motor 28) for displacing the member (13) along a radius of the rotation of the member (13), so as to identify the position of the objects in the entire specimen (11) and detect the property of the objects, the means (27.1, 27) for rotating and the means (27.2, 28.2, 28) for displacing being directly connected to the member (13), the member (13) being rotatable and displaceable along a radius of the rotation of the member (13);
- (g) scanning control means (computer unit 22, interface 26, rotation-pulse emitter 29, translation-pulse emitter 30) for controlling the scanning means (27.1, 27, 27.2, 28.2, 28) for scanning the specimen along the non-linear curve (column 10, lines 26-29);

- (h) storage means (computer unit 22, mass-storage system 23) for storing detector signals (column 9, lines 35-40) relating to the objects provided by the detector (19) and corresponding position signals (column 9, lines 41-45) provided by the scanning control means (22, 26, 29, 30);
- (i) means (computer unit 22) for retrieving the position signals stored in the storage means (22, 23), and
- (j) a microscope (e.g., "... scanning laser-beam microscope ..."; column 5, lines 17-23) for viewing images of the objects, wherein the scanning control means uses the retrieved position signals to place the microscope at the position of the objects to allow performing a detailed examination of the objects (column 12, lines 61-68).

The apparatus of Malin *et al.* lacks to filter through the beam-splitter fluorescent light emitted from the specimen, thereby allowing fluorescent light from fluorescently marked objects to pass through the beam-splitter to the detector and an explicit description that the light spot diameter is between 20-150 μm . However, Malin *et al.* also disclose (column 12, lines 48-54) that the "... unit of measurement used for LPDs is the μmLSE (=micron latex-sphere equivalent), where 1 μmLSE is the diffused-light amplitude produced by a latex sphere of 1 μm diameter ...", (column 8, lines 30-33) that "... LPDs are relatively small in relation to the light spot ...", and (column 2, lines 57-62) that "In scanning, the astigmatic light beam produced by the switchable lens system covers a larger area and thus permits a larger feed offset from one revolution to the next. On the other hand, the dot-shaped light beam is used with a small feed offset and makes possible high local resolution". That is, a light spot diameter of $>1 \mu\text{m}$ (e.g., 50 μm) is taught or suggested by Malin *et al.* since the diameter of the light spot is larger than LPDs having

diameters in units of micrometers (*e.g.*, 1 μm). Further, Hamashima *et al.* teach (column 4, lines 47-59) to provide a dichroic mirror (24 in Fig. 1) for simultaneously detecting three kinds of light information (*i.e.*, the scattered light from the edge of the pattern, the reflection from the pattern and the fluorescence or phosphorescence from the pattern) so that by using these three kinds of light information and the scanning position information of the beam spot, the desired edge detection, pattern position detection and line width and dimension measurement of the different patterns (*e.g.*, the photoresist pattern and the polysilicon pattern) are performed in a diversified manner. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a dichroic mirror as the at least one beam-splitter and other optical components in the apparatus of Malin *et al.*, in order to obtain reflection, scattering, and fluorescence measurements at a desired resolution (*e.g.*, from a 50 μm light spot diameter) so as to determine defects and contamination in a diversified manner.

In regard to claim 7 which is dependent on claim 1, Malin *et al.* also disclose (Fig. 1) that the member (13) is positioned for rotation about an axis on the frame (28.1) and wherein the means (27.1, 27) for rotating the member (13) rotates the member (13) about the axis.

In regard to claim 9 which is dependent on claim 1, Malin *et al.* also disclose (Fig. 1) that the scanning control means (22, 26, 29, 30) are adapted to control the scanning means (27.1, 27, 27.2, 28.2, 28) in such a way that the non-linear curve is a substantially circular curve (*e.g.*, "... the whole of the surface is scanned along a spiral path ..."; column 10, lines 26-29).

The claim limitation "means for sampling and digitising the detector signals and the position signals" is being treated under 35 U.S.C. 112, sixth paragraph and has been construed to cover the corresponding structure described in the specification (e.g., "Each of these digitised detector and position signals is, preferably, represented by a series of digital samples generated by one or several A/D-converters" in lines 13-15 on pg. 9) and equivalents thereof (MPEP § 2181).

In regard to claim **11** which is dependent on claim 1, Malin *et al.* also disclose (Figs. 1 and 5a) means (analog-digital converter 78, rotation-pulse emitter 29, translation-pulse emitter 30) for sampling and digitizing the detector signals and the position signals.

The claim limitation "signal processing means operatively connected to the detector to detect a presence of an object based on the detector signals" is being treated under 35 U.S.C. 112, sixth paragraph and has been construed to cover the corresponding structure described in the specification (e.g., "Signal processing means may subsequently retrieve and use these corresponding coherent data sets to enhance the discrimination between signals originating from target objects and false positive signals" in lines 7-9 on pg. 11 and "The storage means may be located in a personal computer (PC), which is operationally connected with the apparatus of the present invention" in lines 8-9 on pg. 14) and equivalents thereof (MPEP § 2181).

In regard to claim **12** which is dependent on claim 1, Malin *et al.* also disclose (Fig. 1) signal processing means (analyzer electronics 21, computer unit 22) operatively connected to the detector (19) to detect a presence of an object based on the detector signals.

In regard to claim **23** which is dependent on claim 1, Malin *et al.* also disclose (Fig. 1) that a mask (16) is inserted in the optical path between the specimen (11) and the detector (19), wherein the mask (16) comprises at least one transparent aperture (*e.g.*, a slit; column 7, lines 25-29).

In regard to claim **24** which is dependent on claim 23, Malin *et al.* also disclose (Fig. 1) that aperture is a substantially rectangular shape (*e.g.*, a slit; column 7, lines 25-29).

In regard to claim **27** which is dependent on claim 1, Malin *et al.* also disclose (Fig. 1) that the first light source (2) is a coherent light source (*e.g.*, 488 nm laser; column 4, lines 8-12).

In regard to claim **48** which is dependent on claim 1, Malin *et al.* also disclose that the position signals of the marked objects are angular and radial coordinates (*i.e.*, " ... polar coordinates ... "; column 10, lines 11-13).

3. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malin *et al.* in view of Hamashima *et al.* as applied to claim 1 above, and further in view of Worster *et al.* (US 5,479,252).

In regard to claims **15** and **16** which are dependent on claim 1, the modified apparatus of Malin *et al.* lacks an explicit description that the specimen has an area larger than 500 mm^2 (*e.g.*, larger than 8000 mm^2). However, Malin *et al.* also disclose (column 1, lines 18-22) that the specimen is, *e.g.*, a substrate for optical applications or a wafer. Since Malin *et al.* do not disclose and/or require a specific specimen, one having ordinary skill in the art at the time of the invention would reasonably interpret the

unspecified specimen of Malin *et al.* as any one of the known conventional specimens that did not require a detailed description. Further, Worster *et al.* teach (column 4, lines 58-60) that wafer diameters range from 75 mm to 200 mm. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a known conventional specimen (*e.g.*, 200 mm diameter wafer) as the unspecified specimen in the modified apparatus of Malin *et al.*

4. Claims 29, 36, 37, 47, and 49-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malin *et al.* (US 5,377,002) in view of Hamashima *et al.* (US 4,744,663) and Dixon *et al.* (US 5,381,224).

In regard to claims **29**, **36**, **47**, and **49-51**, the cited prior art is applied as in claims 1 and 48 above. The method of Malin *et al.* lacks that the object is a fluorescently marked biological cell or a fluorescently marked microorganism and wherein the specimen has an area larger than 500 mm² (or larger than 8000 mm²). Dixon *et al.* teach (column 1, lines 5-20; column 3, lines 10-61) that an apparatus for measuring both scattered light and fluorescence can be used for both macroscopic semiconductor specimens and macroscopic biomedical specimens (*i.e.*, macroscopic specimens having a size larger than 1 mm X 1 mm). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the modified method of Malin *et al.* can be used for both macroscopic semiconductor specimens and macroscopic biomedical specimens (*e.g.*, a macroscopic biomedical specimen comprising fluorescently marked biological cells).

In regard to claim **37** which is dependent on claim 36, the cited prior art is applied as in claim 11 above.

5. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Malin *et al.* in view of Hamashima *et al.* as applied to claim 1 above, and further in view of Raz *et al.* (US 6,049,421).

In regard to claim **44** which is dependent on claim 1, the modified apparatus of Malin *et al.* lacks an explicit description that the detector comprises a CCD device. Since Malin *et al.* do not disclose and/or require a specific detector, one having ordinary skill in the art at the time of the invention would reasonably interpret the unspecified detector of Malin *et al.* as any one of the known conventional detectors that did not require a detailed description. Further, Raz *et al.* teach (column 2, lines 26-37) to provide a CCD device for scanning a substrate in order to obtain reasonable speed resolution. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a known conventional detector (*e.g.*, a CCD) as the unspecified detector in the modified apparatus of Malin *et al.*

Response to Arguments

6. Applicant's arguments filed 29 August 2008 have been fully considered but they are not persuasive.

Applicant argues that introducing the dichroic filter from Hamashima *et al.* as well as any other optical components from Hamashima *et al.* does not provide the apparatus of Malin *et al.* with a possibility of detecting any fluorescent emission from the object, since such emission cannot pass the dark field stop being an essential part of

Malin *et al.* First, it is noted that applicant has not provided any evidence to support the argument that a dark field stop in the light path will stop the light emitted from the fluorescently marked objects to a degree where detection becomes impossible. Further in response to applicant's argument, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case, the scanning apparatus of Malin *et al.* is for measuring using scattered light. The scanning apparatus of Hamashima *et al.* is for measuring using both scattered light and fluorescence. Thus the combined teachings of the references would have suggested to those of ordinary skill in the art, a scanning apparatus for measuring that uses both scattered light and fluorescence. Therefore, the combined teachings of the cited prior art would have suggested the limitations of independent claim 1 or their dependent claims to those of ordinary skill in the art.

Applicant argues that the claim relates to a light spot being at least 20 times larger, which cannot be read into Malin *et al.* even though Malin *et al.* may teach something which is larger than 1 μm . Examiner respectfully disagrees. MPEP § 2144.05 indicates that in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. In this case, Malin *et al.* state (column 12, lines 48-54) that the "... unit of measurement used for LPDs is the

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μmLSE (=micron latex-sphere equivalent), where 1 μmLSE is the diffused-light amplitude produced by a latex sphere of 1 μm diameter ... ", (column 8, lines 30-33) that " ... LPDs are relatively small in relation to the light spot ... ", and (column 2, lines 57-62) that "In scanning, the astigmatic light beam produced by the switchable lens system covers a larger area and thus permits a larger feed offset from one revolution to the next. On the other hand, the dot-shaped light beam is used with a small feed offset and makes possible high local resolution". The key phrase is "relatively small". That is, Malin *et al.* teach or suggest a light spot diameter larger than LPDs having diameters in units of micrometers. Therefore, the cited prior art teach or suggest "a light spot having a diameter between 20-150 μm " as recited in independent claim 1.

Applicant argues that the amount of luminescent light emitted from a pattern is much more than fluorescent light emitted from a single biological cell or microorganism because the dimension of a pattern in a semiconductor wafer is much larger than a biological cell or a microorganism. Examiner respectfully disagrees. First, it is noted that applicant does not provide any evidence that the dimension of a pattern in a semiconductor wafer is much larger than a biological cell or a microorganism. Further, the cited prior art (*e.g.*, see column 1, lines 23-31 of Worster *et al.*) teaches line widths of features on a chip have shrunk from 10 micrometers several years ago to one micrometers and below today (with line widths approaching 0.3 micrometers or less expected in the next few years). The prior art also teaches (*e.g.*, column 2, lines 3-17 of Saccocio) that " ... the size of a typical cell (which is typically about 25 microns in diameter in mammals) ... ". Thus the prior art teach or suggest that at least some semiconductor wafer pattern dimensions (*e.g.*, ~10 μm) are substantially similar to mammal cell

dimensions (e.g., ~25 μm). Therefore, applicant's arguments are not persuasive. Furthermore, applicant's arguments with respect to amended claim 29 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 4,601,537 (Saccocio) teaches that "... the size of a typical cell (which is typically about 25 microns in diameter in mammals) ...".
8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. L./
Examiner, Art Unit 2884

/David P. Porta/
Supervisory Patent Examiner, Art
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